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ABSTRACT

Commissioned by the Southern Regional Education Board, this document contains summaries of a series of papers on manpower and education in various professional fields. Each paper addresses the following factors: present and future needs for manpower; trends which will affect manpower needs and demands; present capability of higher education to meet manpower needs (with special attention to the South); major trends in education that will affect future manpower supply; and recommendations for state and regional planning. The papers were commissioned in the fields of agriculture, allied health, computer science, dentistry, engineering, law, medicine, nursing, optometry, and social work. The consultants selected to prepare the papers were persons considered to be broadly knowledgeable about the professions concerned and about educational preparation in these professions. (BM)

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MANPOWER AND EDUCATION NEEDS IN SELECTED PROFESSIONAL FIELDS

Summaries of Commissioned Reports

Southern Regional Education Board
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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

INTRODUCTION

Higher education now faces the dilemma of making decisions about adding or reducing programs in an atmosphere of uncertainty about demands for job candidates in many fields. Shrinkage of support for higher education further complicates program decisions and makes it critical that any decisions be good ones, responsive not only to present social needs, but also to those of the future. Clearly, there is the need for some way to guide long-range planning and to assess the institutional programs in a context of state-wide, region-wide, and national needs for professional manpower.

Last fall the Southern Regional Education Board commissioned a series of papers on manpower and education in various professional fields, each paper to address itself to such factors as present and future needs for manpower; trends which will affect manpower needs and demands; present capability of higher education to meet manpower needs (with special attention to the South); major trends in education that will affect future manpower supply, and recommendations for state and regional planning. Papers were commissioned in the fields of agriculture, allied health, computer science, dentistry, engineering, law, medicine, nursing, optometry, and social work.

The consultants selected to prepare the papers were persons broadly knowledgeable about the professions concerned and about educational preparation in these professions. Since time was of the essence, they were not asked to make detailed manpower studies and projections, but rather to make use of such data as were available.

Editor's Note

Following summaries of the manpower papers were prepared by Mary Howard Smith, Special Programs Associate on SREB's staff. The complete papers themselves, available from SREB on request, were written by the following consultants:

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AGRICULTURAL MANPOWER

We do not have hard data on supply of, and demand for, agriculture graduates.

Agriculture has many different meanings, depending on the context in which the term is used.

Schools differ considerably in programs offered and in the terminology used for various fields of specialization.

Schools of agriculture have not conducted follow-up studies of their graduates, and are not the only source of agricultural training.

Graduates of schools of agriculture are employed in a wide variety of industries and occupations.

Among them, those producing agricultural products and associated services;

those producing goods and services utilized in agriculture; and

those producing goods and services for the non-agricultural market.

We do know that the general demand for agricultural labor is declining.

Demand for labor derives from demand for product.

Demand for the major agricultural product, food, does not vary in direct proportion to income; that is, when income rises, the share spent for food will decrease in proportion to the share spent for other goods.

The number of farms has decreased by more than 50%, farm labor by 55% since 1950.

But the demand for highly skilled labor is rising.

The nature of the production process affects the amount of labor necessary and the level of skill required.

Continued technological change in production methods is likely to occur; therefore, growth in the demand for highly skilled labor will continue.

An increasing number of agriculture graduates are entering farm and farm management.

Some growth of demand for graduates of schools of agriculture may therefore be anticipated.

We are experiencing a continued but relatively slow growth in agricultural output and resource use.

Rising research expenditures play an important role in increased demand for college graduates. Expenditures for both publicly and privately supported research have grown substantially in recent years.

Education contributes to increased productivity by increasing the physical efficiency of a unit of labor; contributing to the optimal allocation of workers among uses; and facilitating the selection of optimal numbers of workers.

The management of the agricultural production process requires continuing collection of information regarding new inputs and product forms.

It is important for agricultural education to emphasize principles rather than specifics.

Ability to adapt to rapid technological change depends more on the acquisition of principles from the biological, physical, and social sciences than on acquaintance with current agricultural practices.

The rate of obsolescence of skills is high. Students need only sufficient knowledge of practice to be successful in job entry.

Principles can be learned best through intensive use of time (schooling), while practices are more efficiently acquired through application at work (on-the-job training).

It is also important for schools of agriculture to maintain flexibility in their programming and structure.

Long-term projections are subject to many unknowns and uncertainties.

The "game of numbers" produces unreliable projections of the demand for higher education.

Schools need flexibility so they will be capable of adapting their activities to new and better information as it becomes available.

Schools of agriculture must be concerned with the types of skills likely to be demanded in the future.

Students respond to changing labor markets and educational supply conditions with relatively short lags.

Economies in school size and gains from specialization may be realized in agriculture at the graduate level.

Though studies of educational costs are available, no sound evidence exists regarding economies of size for schools of agriculture.

Since the larger experiment stations are more productive than the smaller ones, and since research and graduate studies are so closely linked in schools of agriculture, gains may be possible through size and specialization at this level.

Regional action could assist agricultural education in several important ways.

Allocation of specializations, agreed upon and implemented cooperatively on a regional basis, would tend to strengthen all programs involved.

Schools of agriculture badly need research on the process of producing educational services and human capital and the costs of this process. Such research conducted in a single institution would not provide information about effects of varying size, organization, practices, etc.

Follow-up studies of former students are almost nonexistent. Multiple studies are needed to give a broad enough picture of current and potential employment in fields related to agriculture.

Studies are also needed of the costs, returns and rates of return associated with agricultural training; that is, the extent to which higher earnings and other satisfactions accruing to the graduate may or may not compensate for the cost of his education (including earnings foregone during his schooling).

COMPUTER PERSONNEL

Certain categories of computer personnel are probably the fastest growing occupations in the 'seventies.

We now have 85,000 computer systems in the United States.

The Bureau of Labor Statistics projects 120,000 computers by 1980. (This estimate may be conservative.)

This would mean at least 105,000 annual openings per year for managers, programmers, systems analysts, and operators.

The Southern region has its proportionate share of computer installations.

Manpower supply in the computer field is also growing.

In the recent past, companies have had to take what staff they could get and train or re-train them.

Today formal educational programs in the field make possible preferential hiring.

Degree programs have doubled since 1966-67.

Programs are now offered from the vocational-technical level through the doctorate.

The South is producing slightly below its share of the manpower supply.

Increase in supply is not keeping pace with growth in demand, but the need is not the same at all levels.

We probably have enough vocational and two-year programs already.

Federal aid has helped implement many vocational and associate degree programs.

We will glut the market with these graduates if small programs proliferate.

Before establishing such a program, careful attention must be given to its probable size versus cost.

A minimum adequate computer installation for this level of training costs about $40,000 a year.

This means $100 laboratory costs per student per year for a student body of 400.

Attention should be given to its articulation with programs at the next level.

Many existing programs are offered in isolation from each other and from higher educational programs, resulting in lack of upward mobility for graduates.

Our greatest manpower needs are at the bachelor's and master's degree levels.

These programs' earlier growth was slower because of lack of qualified staff. This situation is now changing.

It is estimated that the nation needs 560 bachelors' programs with 400 enrollees each to produce the needed 50,000 graduates per year. (There are now 276 programs.)

Clearly providing programs in such number is not possible and would exceed what is congruent with sound program development.

Proliferation of programs is not enough. It is essential that higher education study state and regional needs, strengthen and expand good programs, eliminate weak ones, and initiate programs where need and potential are indicated.

We need more doctorates, but not at the same rate.

If the existing 114 doctoral programs were each producing 10 graduates a year, this would about supply the need.

Present programs should be strengthened and expanded through state and regional cooperation.

Eight Southern states presently have no doctoral programs in the computer field. The regional contract program constitutes a means by which existing programs could be strengthened and numbers of graduates increased on a region-wide basis.

ENGINEERING

The General Picture

Despite recent reports, we actually have a shortage of some engineers.

> Increasing industrialization, especially in the Southern region, means more and more dependence on technology.
>
> The recent economic upturn has prompted many companies to begin rebuilding staff.
>
> Though we are oversupplied in aeronautical and chemical engineering, though supply and demand are about in balance in mechanical, electrical, and mining engineering, there is a marked undersupply of metallurgical, civil, and industrial engineers.

This shortage is going to get worse in the coming decade.

> Engineers are not being produced fast enough to keep up with long-run economic growth.
>
> The supply will be lower each year through 1976 and beyond.
>
> The publicity given to reduced demand in 1969-70 has decreased engineering enrollments. This plus attrition will mean a drastically reduced supply of graduates.
>
> The number of students studying engineering is unlikely to increase much in the foreseeable future.

The shortage of certain kinds of engineers is a result of the times.

> New jobs are being created by attempts to deal with energy, pollution, industrial health and safety.
>
> We are undersupplied in engineers who are well-grounded in fundamentals and not over-specialized.
>
> Also in short supply are engineers who have mastered recently developed techniques (e.g., computer operation).

Those who can apply engineering principles to medical, biological, and other sciences are also in short supply.

This means the engineer of the next decade is going to need new skills.

He will need to be knowledgeable in managing man's environment.

National priorities emphasize the social, urban, and ecological arenas.

Crisis in energy, pollution, and transportation demand engineering input for resolution.

To make better manpower projections for the future, engineering needs better data now.

In the Census and other surveys, the term "engineer" is used so loosely that it is hard to correlate supply and demand.

We need good, accurate, consistent data which distinguish levels of preparation.

Training--Numbers, Levels, And Kinds

We don't need more schools of engineering.

Existing schools have the capacity to provide all the graduates needed at all levels for the foreseeable future.

A "minimum critical size" in engineering programs must be maintained if we are to sustain quality at a reasonable cost.

Proliferation of schools has resulted in many weak, expensive operations. Many engineering schools are underpopulated and uneconomical to maintain.

We do need more students in those we have.

Numbers now graduating may be enough for replacements but will not provide for expansion which will inevitably occur.

Need for additional numbers applies both to baccalaureate and master's programs in professional engineering,

and to associate and baccalaureate programs in engineering technology.

However, we don't need more doctoral programs or doctoral students.

A 9.5% increase in R&D spending (needed, but at present unlikely) would have to develop to justify the employment of the Ph.D.s now being generated.

The Ph.D. engineer is too theoretical and too overspecialized for most industrial and governmental tasks other than R&D.

The need for highly-trained, doctoral-level engineers will increase, but we now have enough quality doctoral programs to meet future needs.

We probably don't need more engineering technology programs.

The swing toward the baccalaureate degree in engineering technology may have gone too far too fast.

Before more BET programs can be encouraged, industry and government must clearly delineate the role of the graduate engineer and that of the graduate technologist with a consistent pattern of recognition, reward, and advancement.

Both breadth and depth of knowledge required in engineering programs are much greater than in BET programs.

Modifications in existing curricula will be needed.

A two-track master's program should be available, with a practitioner-oriented, professional track (M.Engr.) and an academic, research-oriented track (M.S.).

A similar differentiation would be useful at the doctoral level.

At all levels, we need to increase flexibility of offerings, providing problem-oriented, multidisciplinary training.

The engineering graduate will have to be prepared to bring a new dimension to his work. This means adding social and behavioral sciences to the engineering curriculum.

Continuing education is a "must" demanding priority attention.

Rapid change in technological information and requirements means rapid obsolescence.

Continuity in education is essential; re-training has not been successful.

By 1975 the average engineer will have to spend the equivalent of one day a week in some kind of formal education to remain current.

The need for continuing education makes urgent the development and exploitation of educational technology for its delivery.

LEGAL MANPOWER

Our present supply of legal manpower is more than adequate to fill employment opportunities.

- Annual admissions to the Bar have nearly doubled over the 1965 figure, which was an all-time high.
- The number of law students has more than doubled in the past decade.
  - In the South the number of law degrees has increased substantially in every state except Georgia and Maryland.
- In the nation there is one lawyer for every 572 people.
  - In the South, Maryland has more, Florida and Texas about the same, and other states fewer.
- The percentage of lawyers to population has been increasing at a more rapid rate than the population growth.
- The American Bar Association believes we have not overproduced, however.
  - ABA's position is that a large pool of qualified people is a significant national resource for which the organized Bar should share responsibility in finding ways to utilize.

However, there are large segments of our population which cannot get legal services.

- Population ratios do not reflect the ability of the population to employ lawyers.
  - This is especially a factor in the South, where the per capita income is low.
  - Inadequate legal services to the poor are more marked in the South, where there is less federal money.

Neither do they reflect geographic availability. In every state over 50% of the lawyers are in urban communities.

Most lawyers work for business or government.

This is somewhat less true in the South, where there is more small private practice and where national businesses operating in a state tend to depend less on local counsel.

Attempts to project need for legal manpower in the decades ahead are inconclusive.

Certain trends are operating to decrease the demand for lawyers. These include no-fault auto insurance, no-fault divorces, expanded use of title insurance companies in title transfers and increased number of public defender and assigned counsel systems.

Other trends are operating to increase the demand. These include growth in criminal law, recognition of constitutional right to counsel, consumers' rights movement, environmental protection, remedial legislation providing reasonable counsel fees and expanded use of class action.

It seems clear that, though the need for lawyers in traditional fields will decline, needs are developing in new areas. Whether the two trends will balance out is unclear.

Expanded opportunities for legal education are desirable.

There has been a tremendous nation-wide increase of qualified applicants for admission to law schools. Projections indicate that there will continue to be a substantial number of qualified persons who cannot gain admission.

It would be unsound in the long run to restrict arbitrarily the number of places in law schools.

Increased opportunity should be provided for members of minority groups. The schools of the region have failed to keep pace in minority recruitment.

More opportunities for part-time legal education are needed in the South.

In general, part-time programs should be initiated only in conjunction with on-going full-time programs.

New schools should be created only in places of special needs.

The disappointment of those desiring to study law is not in itself a justification for educating more professionals than can be expected to find remunerative employment.

Existing law schools need strengthening. Only 7 of the 42 ABA-approved schools in the region have been ranked class A by the American Association of Law Schools.

Law schools involve sizeable budget commitments even though law is the least expensive of the graduate and professional disciplines.

For example, the median faculty salary is $20,000; the library will require at least 30,000 volumes.

Current trends in legal education (such as increased use of seminars, new concepts of empirical research) tend to increase its proportionate cost.

The creation of new schools will not solve the problem of unmet needs for legal services. It is the distribution of services that causes the problem, not a shortage of lawyers.

Resources will be better spent in making legal services more widely available.

Greater reliance on the use of paraprofessionals will make it possible to provide some kinds of legal services at lower cost.

Law schools and community colleges should train the higher range of paraprofessionals--i.e. those performing functions involving some elements of discretion (e.g. preparation of accounts in probate matters) and those qualified for certain specialized tasks (e.g. real estate closings).

Group legal services, if authorized by law, will render legal services more accessible to many people.

> Group legal services are the provision of legal services through intermediary arrangements (e.g. a labor union or other membership group). At present they may operate in most states only in very restricted matters.

Prepaid legal services, now under consideration in some states, would tend to make legal services more available to middle-income citizens.

Judicare, a government-subsidy system for private lawyers undertaking to represent persons below certain income levels, would make legal services more available to the poor and to rural areas.

HEALTH PROFESSIONS

Background

Our concept of health care is undergoing fundamental changes.

> Health and health care are increasingly regarded as the right of all rather than the privilege of those who can pay for them.
>
> Prevention of illness and maintenance of well-being are goals of health care.
>
> There is greater public awareness of and demand for quality health care.
>
> Some form of national health insurance is almost certain within the foreseeable future.

As a result, our health care system is in a state of transition.

> We are beginning to establish a system (rather than a non-system)--one which is accessible to more people in more places, and in which the parts are interrelated.
>
> We can expect changes to continue for some time--toward more accessibility (we will have more well baby clinics, ambulatory care units, neighborhood health centers, nursing homes, home care programs) and toward more interrelatedness. (Hospitals will form consortia and/or merge with other facilities, often in area health education centers; Health Maintenance Organizations will multiply and expand; professionals will become more interdependent and the team approach will become a necessity.)

We must accordingly revise some of our ideas about health manpower.

> Their numbers: We must discard the idea that we can close the health care gap simply by throwing more money and personnel into it. That has not worked under the "non-system" and will not work under the "system."
>
> Their use: Duties and responsibilities must be assigned on the basis of ability to perform rather than historical precedent. Those who have been chief

givers of care must become managers of doers rather than sole doers themselves.

Their types: New professions will assume increasing importance; for example, more centers will be manned by nurse practitioners and physicians' assistants; comprehensive rehabilitation services will be made available.

Clearly, we need educational planning for the evolution in health care.

Health manpower education should be planned in the context of regional rather than local manpower needs.

So long as the health care system continues transitional, the educational system will need to maintain as much flexibility as possible about numbers and categories to be trained.

Flexibility and interrelatedness will also be required in the curriculum itself. Professionals will work together better if they are trained together.

Changing interprofessional relationships, new specialties, and new responsibilities mean that those in established disciplines will require more continuing education.

HEALTH PROFESSIONS

PHYSICIANS

The Current Manpower Picture

Our shortage of physicians is really a problem of maldistribution, imbalance and disorganization rather than one of numbers.

> The national ratio of about 150 physicians per 100,000 population (not including those employed by the federal government) could provide adequate services if they were equitably distributed geographically, if there were a balance within the profession by specialty, and if the health care system were better organized.

By far most physicians are located in urban areas.

> There are whole rural counties (61 of them in the Southern region) where there were no doctors last year.
>
> Physician supply in ghetto and low-income metropolitan areas is also low. Physicians tend to go to areas where the median income and level of education are fairly high.
>
> The location of internship and residency programs usually influences the physician's choice of locale for practice. Most internship/residency programs are in large urban settings.

The distribution of doctors among the various specialties is out of balance with the need for them.

> Surgeons and some surgical specialties are in oversupply.
>
> Half of our physician force should be devoted to primary care if society's needs are to be met. Instead, only 37% are.
>
> Family Practice as a specialty is so new that its impact cannot yet be evaluated. However, indications are that we need many more of these physicians.

The health care system is not now organized to use physician manpower effectively.

The relatively unorganized fee-for-service private practice approach to medical care does not insure coverage and is uneconomical of time and money.

Trends Toward Solutions

Several promising approaches to improving physician manpower utilization are evident.

When the nurse's role is enlarged, and/or when physician's assistants are employed, the doctor can deliver more health care to more people.

Multi-specialty group practice provides more services and wider coverage more economically than solo private practice.

Health Maintenance Organizations (HMO) can combine the benefits of both the above, assuring provision of comprehensive health services to a defined population group on a pre-paid capitation basis.

However, the development and operation of HMOs involve many complex problems, so we must expect their growth to be gradual.

Solutions to the distribution problem are also in view.

The recently established National Health Service Corps permits the recruitment of physicians and other health professionals by DHEW and their assignment to areas where health manpower is short.

Area Health Education Centers (AHE), based in community hospitals and affiliated with medical school centers, attract prospective physicians for graduate training and practice in areas of need.

(It is conceivable that, by involving medical students in primary care, AHEs will also help correct the imbalance among medical specialties.)

The growth of emergency care resources--involving communications with and transportation to a receiving hospital--will help mitigate doctor "shortage."

Implications For Medical Education

We do need to provide more opportunities for medical education.

- Though population growth has slowed down, populations with substantial health problems are increasing: infants, older people, and the urban poor.
- The inevitable enactment of a national health insurance program will greatly increase the demand for medical care.
- Racial minorities and women are under-represented in our present physician manpower force.
- Expansion of opportunity for medical education appears especially desirable in the South, where the ratio of physicians to population in many states is well below the national average.

But this does not necessarily mean we need more medical schools.

- The number of schools and their enrollments have increased substantially in the last few years.
- The newly established schools have not yet been in operation long enough for their impact to be felt.
- Financial and other support requirements for good medical schools must be considered prohibitive in many instances.
  - Expenditures for 4-year accredited medical schools in 1970-71 averaged $19.7 million.
  - A new medical school usually generates a whole health sciences complex. Ultimate financial requirements therefore greatly exceed the cost of the medical school itself.
  - It is important to provide a medical school with a strong university base. Modern medical education demands a concentration of resources which can best be provided in a strong university.

Area health education centers offer an alternative preferable, in many cases, to establishing a new medical school.

They help in the better distribution of medical graduates.

They give students an opportunity to see what the medical world is really like outside the medical school center.

They can provide greater involvement in family and primary care.

They help to upgrade the quality of care in their area.

They greatly facilitate programs of continuing education.

Certain changes in curriculum should help produce physicians who can serve our needs better.

Some of these changes are already under way and should be encouraged:

- Incorporation of social and behavioral sciences
- Interdisciplinary approach to physiological systems
- Early patient care experience
- More flexible program with more electives and different "tracks"
- Family practice or primary care programs
- Development of community medicine
- Shortened undergraduate curriculum
- Shortened internship/residency period
- Development of audiovisual materials and techniques.

And additional changes are called for:

Support of and affiliation with one or more Area Health Education Centers to encourage outreach and enhance the service and community orientation.

Greatly expanded, high qualtiy residency and internship opportunities for family practice.

Provision, during training, of experience in working with nurse practitioners and physicians' assistants.

Training in planning and administering health services and in the formulation of public policy in health care services.

HEALTH PROFESSIONS

NURSES

We really don't know the extent to which we still have a shortage of nurses.

The national average is 361 registered nurses to 100,000 population.

In the South the proportion is lower, but a higher percentage of RNs is actually in the workforce.

In the South the ratio of licensed practical nurses is high. However, as more RNs become available, they are being hired.

Nurse manpower studies are usually limited to hospitals and ignore needs of extra-hospital services. It is in the extra-hospital setting that the need for nurses is growing most rapidly.

We know there are not enough nurses in certain places and in certain jobs.

Maldistribution affects even states where the nurse/population ratio is most favorable. In several states units of new hospitals are unused because of the lack of qualified nursing personnel.

The aged, the chronically ill and the mentally ill are underserved by all types of health professionals, including nurses.

There is a tremendous dearth of nurses prepared for work in public health.

Also in short supply are nurses prepared for leadership responsibilities: teaching, first-level management in nursing service, clinical specialization, community nursing, administration and research.

More training programs is not the answer.

Diploma (hospital) programs still constitute 39% of the programs preparing for RN licensure in the nation, 26% in the South, though their numbers are decreasing both regionally and nationally.

Numerically they are more than being replaced by 2-year and 4-year degree programs.

From 1966-1971 associate degree programs increased by 246% nationally, baccalaureate programs by 55%.

The figures for the South are 275% and 46%. Many of our Southern collegiate nursing programs, therefore, are new or developing.

We need to strengthen the programs we already have.

Most existing programs are relatively low in productivity. This is especially true in the South, where average graduations per program are fewer than in the nation as a whole.

Though there is an abundance of programs, most are beset by shortage of qualified faculty and shortage of funds.

Strengthening is especially needed in those programs in traditionally black colleges, which suffer from problems in recruiting qualified applicants, in obtaining adequate resources, in recruiting and retaining faculty, and in attaining national accreditation.

Sharing and collaboration among graduate programs in the Region should be accelerated to assure effective utilization of resources.

We need to redesign present programs to facilitate desirable change in the health care system.

Health manpower needs across the board must be studied and nursing curricula reviewed in light of the total picture.

Existing types of programs preparing for RN licensure should be restructured according to expected levels of practice.

Higher degree programs must take account of the trend toward greater responsibility for nurses in the delivery of primary health care and in long-term illness.

We need especially to provide an ordered and available system of continuing education for nurses.

In the immediate and long-range future it is essential that continuing education receive higher priority in planning, staffing and funding.

Information on continuing education for nurses in the South indicates the need for significantly greater state support.

A more effective system of continuing education must be provided before legislation is enacted making continuing education a condition of license renewal.

HEALTH PROFESSIONS

DENTISTS

Dental Manpower In The Immediate Future

Our supply of and demand for dentists are about in balance now.

> Nationally there is no shortage of dentists to meet the effective demand. People who want dental care badly enough are receiving it.
>
> About 19% of practicing dentists could take more patients.
>
> (However, dentist supply is somewhat less favorable in the South, where dentists are more likely to be too busy to take more patients.)

Effective demand for dental services is less than actual need for them.

> Dental problems are universal; everybody has them sooner or later.
>
> Dental disease does not heal like a cut or infection, but accumulates.
>
> It is estimated that 40% of Americans have immediate and critical dental treatment needs.
>
> Low income persons, uneducated persons, and those living away from cities tend to seek dental care only when confronted with pain.

There is little doubt that effective demand will soar in the near future.

> Demands for dental services increase with higher income, more education, and urban residence. Continuing trends of rising income levels, rising educational levels, and urban migration will increase demand sharply.
>
> The proportion of oldest and youngest age groups is growing. Both have great accumulated needs for dental services.

The spread of prepaid health plans will convert some of the backlog of unmet need into effective demand.

A national health insurance plan will mean huge increases in public demand for service.

In less than 20 years we could experience a serious deficit of dental manpower.

Projections indicate that the demand will nearly double from income rise alone.

The demand will independently double from rising educational level.

The supply of dentists has remained fairly stable as a proportion of the population for several decades, and probably will continue to do so.

At that rate we will have a national shortage of 16,500 dentists in 1990, even if there is no national health program. (With a national program the deficit will be 34,000.)

Projection of shortage is based on unchanged practice patterns. We can provide for more patients if we will deploy dental manpower more efficiently.

Though partnership practice has a 44% higher patient-visit capacity than solo practice, 77% of our dentists practice alone.

Effective use of a chairside assistant can increase a dentist's patient capacity by at least 33%, yet 40% of our dentists use no full time office assistants.

Expanded-function dental auxiliaries, conducting certain procedures without supervision, could increase patient capacity even more--some estimate as much as 105%.

If all dentists would use expanded-function auxiliaries from 1975 on, by 1990 there would be no deficit in dental services.

Immediate and thorough preparation is essential if we are to avert a dental care crisis.

State practice acts must be reviewed and revised. Many of them now tend to discourage partnership

practice and the use of auxiliaries, and prohibit the assignment of non-supervised duties to expanded-function auxiliaries.

Dental licensure should be done on a national or regional basis. (Regional reciprocity already exists in most Middle Atlantic and New England states. A regional pact is under consideration by Pacific states.)

A newly-financed dental care program will require very careful definition and control; otherwise costs will skyrocket.

Comprehensive Health Planning Commissions should be made fully aware of dental needs and resources.

Incentives (such as guaranteed income level) must be developed to bring dentists into rural and ghetto areas.

Dental Education And Future Manpower

It would be impractical and unwise to expect to meet the anticipated manpower shortage by building more dental schools.

In the long run we may need a few more schools, but extreme caution should be urged in starting them now.

With the withdrawal of Federal funds, states must be prepared to provide full costs.

This means $8 to $9 million construction costs for a dental school, built in conjunction with a medical school and sharing some facilities. Then it means about $2.4 million a year for operating.

We will not really know the extent of our need for more dental schools until we can assess the effects of increased usage of expanded-function auxiliaries. (They can be prepared much more quickly and at far less cost.)

Southern dental school graduates do tend to remain in the South. States not having dental schools should seriously consider expanding contractual arrangements for dental education with neighboring states.

Existing dental schools should take an active role in preparing for needed professional changes.

They must take leadership in experimenting with the use of dental auxiliaries of all types.

They must be in a position to rapidly expand auxiliary training when licensure restrictions are removed.

They should also expect to provide training programs for dental students and for practicing dentists to learn how to work with expanded-function auxiliaries.

Schools should take steps to expand our pool of dental graduates by experimenting with programs to educate dentists in a shorter time (but without reducing their training in basic science); by making a concerted effort to attract underrepresented population groups (blacks and women) into the profession, and by cooperating in regional recruitment programs.

Dental faculties should be involved in comprehensive health planning. They must assist in establishing state and region-wide service plans, with goals and timetables.

HEALTH PROFESSIONS

ALLIED HEALTH

Background

We do not have complete or reliable data on the present manpower pool or manpower needs in allied health.

- Difficulties in defining and categorizing "allied health" result in inconsistent reporting.
- Variations in terminology (job titles) often make it impossible to compare and combine data.
- Projections of need are invalid because they are based on the assumption that health care will continue to be provided in the same way it has been previously.

We estimate that allied health manpower has tripled in the last 15 years.

- During the same period primary care manpower doubled.

Much of this growth has resulted from the creation of new categories of workers.

- Specialties have subdivided into different levels of preparation and of ability to function.
- More and more professionals delegate certain responsibilities to assistants specifically prepared for these tasks.
- Technological developments and the rapid expansion of scientific knowledge have brought about many new specialties.

We may be on the verge of overproducing and overproliferating.

- USPHS estimates that, if the rate of growth of the past decade continues, there will be an oversupply of 114,000 allied health personnel by 1975.
- However, the potential surplus does not apply equally to all categories.
- It does suggest the necessity of viewing critically any proposals of manpower needs.

It suggests also the urgency of basing planning and recruiting activities on the most up-to-date information possible.

Educating Allied Health Manpower--General

The movement of allied health programs out of health facilities and into educational institutions will continue.

Preparation of the bulk of allied health personnel will become increasingly the responsibility of junior colleges and technical institutes.

The role of the senior universities will shift to include preparation of highly sophisticated allied health professionals; preparation of faculty and administrative personnel; and curriculum development, research, and evaluation in allied health.

The allied health professions are interdependent and fare best when so treated in educational programs.

Organizing allied health instruction into "academic conglomerates" permits economies of effort, funds, and facilities.

Such organization provides the opportunity to develop an interdisciplinary approach to health care education.

Interdependence must go beyond the confines of one institution if educational programming for health care is to be realistic and useful.

Institutions developing allied health programs need to know the programs and plans of other institutions.

They also need the most current information possible about health care and manpower trends.

Consortia of institutions engaged in allied health training would engender cooperative and collaborative relationships.

Region-wide efforts in data-gathering and educational planning would provide a sound basis for intra-institutional planning.

Allied health personnel will assume increasing responsibility for health care. Their education must be equal to the task.

Curricular trends in the direction of quality must be encouraged.

This means articulation among the several levels of preparation to permit upward mobility; equivalency examinations, making the possession of knowledge and skills more important than where the individual got them; and more meaningful integration of clinical experience with theoretical learning.

All health workers must have opportunities for continuing education. The knowledge explosion, changing roles, and proficiency reviews for renewed licensure or registry will render this essential.

Educating Allied Health Manpower:
Specific Selected Categories of Personnel

We probably now have enough programs in the region to train various kinds of clinical laboratory personnel.

This group includes Clinical Laboratory Assistants and Histologic Technicians (vocational-technical programs), Medical Laboratory Technicians and Nuclear Medicine Technicians (associate degree programs), Medical Technologists (baccalaureate program), Blood Bank Technologists and Cytotechnologists (post-baccalaureate, non-degree programs).

Needs for added numbers will continue, but the rate of increase in demand will slow down considerably.

We already have enough such programs to produce the supply that will be needed.

In fact, some consolidation of programs within individual categories would be desirable.

Hospital administration is no longer a field where there is a personnel shortage, but we will need administrators for other kinds of health centers.

There are now not enough top-level openings for graduates of master's programs in hospital administration.

There is need for directors of small hospitals, rehabilitation centers, outpatient clinics, HMOs, etc., as well as for financial managers, health planners, and assistant directors of hospital units.

Many of these could be adequately prepared at the bachelor's level.

We still do not have enough personnel in the field of medical records and many of our training programs are obsolete.

Medical Records Administrators (formerly Medical Records Librarians--baccalaureate training) and Medical Records Technicians (associate training) are still in short supply.

States not having one of each of these programs might profitably establish them.

Unquestionably computerization in this field will increase. Educational programs should expand those portions of their curricula concerned with computerized data processing.

Prevalent methods of preparing Psychologists miss the mark for the health care system.

We do not need more doctoral programs. We do need doctoral-level preparation of clincial and counseling practitioners. Present doctoral programs are overwhelmingly oriented toward research and academic careers.

We also need better definition of the roles to be performed by psychologists with baccalaureate and master's training, and educational programs designed accordingly.

In the South we have a serious shortage of approved internships for doctoral candidates in psychology.

Radiology and radiation manpower needs suggest that training programs should be upgraded.

The continuing shortage of Diagnostic Radiologists (M.D.) means more Radiologic Technologists are needed and their duties are increasing in sophistication.

This suggests that the shift of Radiologic Technology programs from clinical x-ray departments to associate degree programs should be accelerated and consideration be given to expanding preparation to the bachelor's degree.

Similarly, shortage of Therapeutic Radiologists (M.D.) means greater need for higher-level Radiation

Technologists (i.e. Radiation Medicine Dosimetrists, Radiation Physicists, Medical Radiation Specialists) with at least baccalaureate preparation who can handle more complex assignments.

Demand for Respiratory Therapy workers will continue to grow.

Chronic lung disease is increasingly prevalent.

Advanced technology in artificial respiratory aids requires specially trained workers.

The present 2-year program for Respiratory Therapists may well expand to a baccalaureate program.

The newly-approved category of Respiratory Therapy Technician (12 months program) will also be needed.

Manpower and Education Needs in Selected Allied Health Fields

Entry Level Training*	Profession/ Category	Manpower Needs	Needs for Training Programs
1. P	Blood Bank Technologist	Need for additional numbers slowing down.	No new programs needed.
2. P	Child Health Assoc/Asst.	Increasing	Yes
3. M	Clinical Nutritionist	Increasing	Revise Bac. prog. to include clinical training.
4. V	Clinical Lab. Asst.	Need for additional numbers slowing down.	No new programs needed.
5. D	Clinical/Counseling Psychologist	Need utilization of those with less than doctorate.	Need doct. progs. oriented to practice; internships.
6. P	Cytotechnologist	Need for additional numbers slowing down.	No new programs needed.
7. A	Dietetic Technician	Unclear	Unclear
8. P	Dietitian	Demand/supply for health facilities in balance.	No new programs needed.
9. A	Extended Care Facility Admin.	Unclear	Unclear
10. B/M	Health Educator	Increasing	New programs will be needed where states have none.
11. B/M	Health/Hospital	Demand for top level Hosp. Admin. less than supply.	Need Bac. level training for other positions.

Entry Level Training*	Profession/ Category	Manpower Needs	Needs for Training Programs
12. V	Histologic Technician	Need for additional numbers slowing down.	No new programs needed.
13. A	Medical Lab. Technician	Need for additional numbers slowing down.	No new programs needed.
14. B	Medical Technologist	Need for additional numbers slowing down.	No new programs needed.
15. B	Medical Record Admin.	Undersupplied	New programs desirable where states have none.
16. A	Medical Record Technician	Undersupplied	New programs desirable where states have none.
17. A	Mental Health Worker	Increasing	Questionable
18. A	Nuclear Medicine Technician	Need for additional numbers slowing down.	No new programs needed.
19. B/M	Occupational Therapist	Supply OK if OT Ass'ts effectively used.	No new programs needed.
20. A	Occupational Therapy Asst.	Increasing	Probably need more.
21. ?	Orthotist	?	Continuing education.
22. B/M	Physical Therapist	Oversupply in some places. Maldistributed.	Caution indicated re new programs.

Entry Level Training*	Profession/ Category	Manpower Needs	Needs for Training Programs
23. A	Physical Therapy Asst.	Increasing	Unclear
24. C	Physician's Assistant	Increasing	Unclear
25. C	Prosthetist	Some shortage.	Continuing education.
26. B	Radiation Med. Dosimetrist	Need will increase.	Probably need more.
27. C	Radiation Ther. Technologist	Increasing	Upgrade to Baccalaureate
28. C/A	Radiologic Technologist	Increasing	Upgrade to Baccalaureate
29. B/M	Rehabilitation Counselor	Need for additional numbers slowing down.	No new programs needed.
30. A	Respiratory Therapist	Increasing	Probably need more. Consider upgrading to Bac. level.
31. V	Respiratory Ther. Technician	Increasing	Will need new programs.
32. B/M	Speech Pathologist/ Audiologist	Some undersupply. Serious maldistribution.	More programs not the answer.

*Legend, Entry Level of Training.

A = Associate degree
B = Bachelor's degree
C = Post-secondary, certificate program
D = Doctorate
P = Post-baccalaureate, non-degree program
V = Vocational-technical program

OPTOMETRISTS

Need For Optometrists

Optometrists provide 75% of our vision care services.

In 40% of the nation's communities they are the only source of vision care.

Optometrists' services consist of clinical refractions, fabricating and dispensing eyewear, visual screening examinations, clinical instrumentation, contact lens fitting, visual training, orthoptics, providing low vision aids and artificial eyes, solving industrial vision problems, consultation, and engaging in community health activities.

A rapidly expanding responsibility is school consultation and remedial services for low achievers.

Some optometrists specialize. These specializations are in visual perceptual problems of children, visual efficiency and eye safety requirements in industry and motor vehicle operation, visual care and functional restoration of the partially sighted, and visual problems of the geriatric patient.

But all optometry graduates are prepared to render basic services in all these specialty areas.

Ninety percent of all vision problems can be competently treated by optometrists. The balance either require medical or surgical treatment or are untreatable.

Next to dental problems, vision problems are most prevalent in the total health problem.

Most of them are chronic and cumulative and are seldom cured or outgrown.

Children from three to 18 years old and persons over 45 are the highest risk groups. Both are increasing as a proportion of the population.

Chronic vision problems require regular attention. Treatment usually cannot cure them, but it can compensate and restore their function.

Optometry also performs prevention functions - i.e. prevention of blindness or prevention of behavioral problems due to vision problems.

We have far too few optometrists for our needs, especially in the South.

An "adequate ratio" is considered to be 14 optometrists per 100,000 population. The national average is 8.9.

No Southern state comes up to this. As a region the South is below the "critical shortage" ratio of 6.4 set by USDHEW.

The 3,770 optometrists we do have in the region are widely and thinly distributed.

Forecasts indicate the shortage may become less severe, but not much.

The rapid increase of optometry enrollments and graduates since 1965 has not kept up with the need.

Assuming no new schools of optometry, but assuming existing schools continue full, by 1990 the nation will have 9.5 optometrists per 100,000 population, the South 6.7.

Any gains in numbers will be more than offset by increase in demand for services.

The growth in third-party payment systems will translate much of the present unmet need into active demand. National health insurance will raise demand sharply.

Solutions And Higher Education

Several approaches to the vision care shortage must be pursued simultaneously. Higher education has a responsibility in all of them.

Optometry technician training programs must be expanded and developed.

Greater use of technicians could extend available services by 20-25%.

Funds and effort in research and development must be invested to advance optometric technology.

Automation of procedures and computerization of records could increase the availability of vision care systems even with decreasing optometric manpower.

Vision care services must be reorganized so as to integrate the services of all components - optometry technicians, optometrists, and opthalmologists - in such a way that each will be utilized at his highest level of skills.

> Task and systems analysis, as well as research in manpower utilization and patterns of practice, will be required to do this.

The number of training opportunities for optometrists must be increased.

> This need is especially great in the South, where it is estimated we could use three more schools (in addition to our present three), plus expansion of the contracts-for-services program.

Establishment of a new school of optometry requires substantial educational and financial resources.

> Optometry education takes at least six years beyond high school: 2 (sometimes 3) pre-professional and 4 professional.
>
> Internship is included in the degree program.
>
> Optometric treatment methods depend on educational and psychological technology as well as optical, physiological, and biomedical knowledge.
>
> A school of optometry for a student body of 200 costs about $5 million in capital outlay plus 1.6 million annual operating expenses.
>
> These quotations assume that the school is part of a medical center and uses the center's basic science facilities.

Any new optometry school in the South will need regional support and must assume regional responsibility.

The need for optometric manpower extends beyond the boundaries of any one state.

In the absence of federal support, state and local support will be insufficient.

HEALTH PROFESSIONS

SOCIAL WELFARE

Society's demand for social workers continues to grow.

The job market for social workers is diversifying. They are employed in a greater variety of settings, with increasing opportunities in public schools, mental health agencies, day care centers, crisis and drug centers, etc.

This trend tends to offset the shrinkage occurring from cutbacks in federal programs.

The need for those with professional preparation continues great as they are sought for new positions and replacements.

120,000 of the 170,000 social work positions are still filled by persons without specialized training.

Our supply of social workers is also growing fast.

Much of this is due to the recognition and growth of baccalaureate programs.

Bachelor's degree graduates are now placed in positions for which the master's degree was formerly sought, but which often of necessity were filled by untrained personnel. There is also a growing number of associate degree programs whose graduates move into technical positions. The impact of the federal and state training grants programs of the 'sixties is beginning to be felt.

In general we do not now need more training programs.

In the South we now have 20 master's programs and 59 approved baccalaureate programs.

These are enough to meet present and future manpower needs, especially as many of the bachelor's programs are not yet operating at capacity.

88.5% of the region's demand for social workers is now being met by the region's graduates.

However, social work manpower needs should be monitored continuously at local and state levels. In some instances several undergraduate programs well distributed geographically might be more effective than one or two large programs concentrated in urban settings.

We do need more social work doctorates.

Social workers with doctoral preparation are badly needed for faculty for the growing undergraduate programs.

Doctorates are also needed for high-level administrative, planning and research positions.

In the South we have only one doctoral program in social work. Four others are in the planning stage.

Our chief needs in social work education are for structural program changes.

The 2-year master's degree should be re-examined in light of increasing quality and quantity of baccalaureate preparation.

Master's programs are now expected to supply personnel for middle management positions, advanced practice, and training.

We should consider the desirability of two types of doctorates: One to prepare for teaching and one for research.

Continuing education is urgent enough to warrant its comprising one-fourth of the program of any institution.

Above all, we need true articulation of programs at all levels, associate through doctorate.

Many states are reclassifying social work positions to provide a viable career ladder from aide through administration.

Careful assessment of needs and institutional resources is essential before a new program is undertaken at any level.

The institution should take every precaution to assess need for the program in terms of manpower requirements.

The institution must then make sure it can provide 100% of the cost, which must cover a relatively low student-faculty ratio. Also interdisciplinary support from the entire institution, field learning under academic supervision and for academic credit, and articulation with other programs at other levels.